

REMARKS

Reconsideration of the subject application is respectfully requested.

The present invention relates to disk brakes of the type wherein a shim is disposed between each brake pad and its respective pressing device. The shim comprises first and second shim members, one of which possesses grease-storage regions, an expedient known from each of *Japanese Laid-Open Utility Model Publication No. 3-32 2224* and *Matsumoto et al.* U.S. Patent 6,116,384. Note that Japan '224 discloses two shim members 36 and 38, with the shim member 38 including grease-storage regions in the form of slots. As observed in the background section of the present application, that publication proposes to increase the slot width in order to increase the grease storage capacity. Although grease becomes relatively flowable when heated, there is no risk of grease escaping from the disk brake in Japan '224, because a resilient seal 42 is provided in the space between the brake pad and the shim member.

Likewise, *Matsumoto et al.* discloses grease-storage regions 11d, but without any discussion about the size of those regions. Like the arrangement disclosed in Japan '224 the device of *Matsumoto et al.* employs a resilient material in the space between the shim and the brake pad, the material being coated on both sides of the shim as described in the last paragraph of column 3. That resilient coating would function as a seal to retain the grease, similar to the resilient seal 42 of Japan '224.

The present inventor has, however, devised an arrangement wherein the escape of grease is prevented by configuring the storage regions so that the grease is retained in the storage regions by the surface tension of the grease, at least when the grease temperature is in a range of 20 to 200° C, as recited in each of claims 1 and 6.

Neither Japan '224 nor *Matsumoto et al.* contemplated or expressed any awareness that grease loss could be controlled by surface tension of the grease. In fact, Japan '224 discloses to widen the slit size, which is in direct contrast to the presently claimed invention.

Matsumoto et al. provides no discussion of hole size, grease type, or grease behavior. In the Official Action it is stated that it is advantageous for the grease used in *Matsumoto et al.* to have a specific viscosity corresponding to the temperature range of the environment, to remain in the opening. That presumes that there even exists a suitable grease that would achieve such a result if used in *Matsumoto et al.*. It also presumes that *Matsumoto et al.* would be concerned about grease loss. However, as noted above, the resilient coatings applied to the shim members of *Matsumoto et al.* would function as seals to retain the grease.

It is submitted that none of the prior art of record has even remotely disclosed or taught the concept of relying on surface tension to control grease loss as recited in claims 1 and 6, and it is submitted that those claims are allowable.

In the Official Action, dependent claims 3, 5, 9 and 12, which recite preferred dimensions of the storage regions to achieve grease surface tension suitable for retaining the grease within the storage regions, were rejected on the grounds that discovering the optimum or workable ranges involves only routine skill in the art, citing In re Allen, 105 USPQ 33.

As a general proposition, it is true that an artisan would find it obvious to discover optimum or workable ranges to achieve a particular result, but it is necessary to discern the particular result that is the object of optimization. The present inventor is trying to optimize the size of the storage region in order to best control grease flow by surface tension. Neither Japan '224 nor *Matsumoto et al.* has

that intention in mind; Japan '224 is trying to maximize the amount of grease capacity, whereas *Matsumoto et al.* expresses no intentions about the grease storage regions except that they should be provided. Neither publication expresses concern about grease loss, let alone the best way to prevent it. In the Allen case cited in the Official Action, the prior art and the pending application were trying to achieve the same result, namely maximizing the yield from a chemical procedure. In the present instance, an artisan would not be provided with motivation from either Japan '224 or *Matsumoto et al.* to experiment with the size of grease-storage regions for achieving optimum surface tension behavior, since neither document even mentions surface tension and each document employs a grease-retaining seal structure. Accordingly, it is submitted that the original claims 3, 5, 9 and 12 further distinguish patentably over the applied prior art.

Furthermore, to emphasize an advantage achieved by the presently claimed invention, dependent claims 14 and 15 have been added which recite that the space between each back plate and a respective first shim member is free of resilient seal structure. That feature, described in paragraph 0035 of the application, is contrary to the devices of Japan '224 and *Matsumoto et al.* which employ resilient seal structure in that space

Accordingly, it is submitted that claims 14 and 15 further distinguishes patentably over the applied prior art.

As regards dependent claim 10, that claim was rejected over *Matsumoto et al.* in view of *Chen et al.*, it being asserted as obvious to make the recesses of *Matsumoto et al.* extend in a radial direction in view of the parallel recesses 37 of *Chen et al.* However, the recesses of *Chen et al.* are intended to dampen brake squeal by creating tuning forks, which is different from the provision of grease.

Claim 10 has been amended to recite spaced-apart recesses that are completely surrounded by material of the shim. That is not the case in *Chen et al.*, because the parallel recesses must be joined together by curved recess portions in order to create the tuning forks. Accordingly, it would not have been obvious from *Chen et al.* to provide the shim of *Matsumoto et al.* with recesses of the type defined in claim 10, and allowance of claim 10 is respectfully requested.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application, the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

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